

CLAIMS

[cl001] 1. A curing light comprising:

a wand adapted to be grasped by a human hand for use in positioning and manipulating the curing light,

a power supply,

electronic control circuitry for controlling the curing light,

a light module,

said light module including a secondary heat sink, said secondary heat sink being configured to assist in heat dissipation,

a primary heat sink affixed to said secondary heat sink,

at least one light emitting semiconductor chip mounted on said primary heat sink, and

means for providing pulsed current input to said chip in a square wave pattern that consists of periods of current input at a level I followed by periods of rest with no current input in order to provide light output at an average light output power level that is greater than the light output power level that would result from providing continuous wave current input to said chip at current input level I.

[cl002] 2. A curing light as recited in claim 1 wherein I is from about 25 millamps to about 2 amps.

[cl003] 3. A curing light as recited in claim 1 wherein I is from about 350 millamps to about 1.2 amps of current.

[cl004] 4. A curing light as recited in claim 1 wherein I is more than about 100 millamps of current.

[cl005] 5. A curing light comprising:

a wand adapted to be grasped by a human hand for use in positioning and manipulating the curing light,

a heat sink, said heat sink being configured to assist in heat dissipation,

at least one light emitting semiconductor chip mounted on said heat sink,

said chip being selected from the group consisting of light emitting diode chips, laser chips, light emitting diode chip array, diode laser chips, diode laser chip arrays, surface emitting laser chips, edge emitting laser chips, and VCSEL chips, and

electronic control circuitry for providing pulsed current input to said chip in a square wave pattern that consists of periods of current input at a level I followed by periods of rest with no current input in order to provide light output at an average light output power level that is greater than the light output power level that would result from providing continuous wave current input to said chip at current input level I.

[cl006] 6. A curing light as recited in claim 5 wherein I is from about 25 millamps to about 2 amps.

[cl007] 7. A curing light as recited in claim 5 wherein I is from about 350 millamps to about 1.2 amps of current.

[cl008] 8. A curing light as recited in claim 5 wherein I is more than about 100 millamps of current.

[cl009] 9. A curing light comprising:

a wand adapted to be grasped by a human hand for use in positioning and manipulating the curing light,

a heat sink, said heat sink being configured to assist in heat dissipation, at least one light emitting semiconductor chip mounted on said heat sink, said chip having a plurality of epitaxial layers, at least one of said epitaxial layers being an active layer which when bombarded with electrons releases photons,

and

electronic control circuitry for providing pulsed current input to said chip in a square wave pattern that consists of periods of current input at a level I followed by periods of rest with no current input in order to provide light output at an average light output power level that is greater than the light output power level that would result from providing continuous wave current input to said chip at current input level I.

[cl010] 10. A curing light as recited in claim 9 wherein said chip is selected from the group consisting of light emitting diode chips, laser chips, light emitting diode chip array, diode laser chips, diode laser chip arrays, surface emitting laser chips, edge emitting laser chips, and VCSEL chips,

[cl011] 11. A curing light as recited in claim 9 wherein I is from about 25 millamps to about 2 amps.

[cl012] 12. A curing light as recited in claim 9 wherein I is from about 350 millamps to about 1.2 amps of current.

[cl013] 13. A curing light as recited in claim 9 wherein I is more than about 100 millamps of current.

[cl014] 14. A curing light comprising:

a wand adapted to be grasped by a human hand for use in positioning and manipulating the curing light,

a heat sink, said heat sink being configured to assist in heat dissipation,

an array of light emitting semiconductor chips mounted on said heat sink,

at least one of said chip having a plurality of epitaxial layers,

at least one of said epitaxial layers being an active layer which when bombarded with electrons releases photons,

and

electronic control circuitry for providing pulsed current input to said chips in a square wave pattern that consists of periods of current input at a level I followed by periods of rest with no current input in order to provide light output at an average light output power level that is greater than the light output power level that would result from providing continuous wave current input to said chips at current input level I.

[cl015] 15. A curing light as recited in claim 9 wherein said chips are selected from the group consisting of light emitting diode chips, laser chips, light emitting diode chip array, diode laser chips, diode laser chip arrays, surface emitting laser chips, edge emitting laser chips, and VCSEL chips,

[cl016] 16. A curing light as recited in claim 15 wherein I is from about 25 millamps to about 2 amps.

[cl017] 17. A curing light as recited in claim 15 wherein I is from about 350 millamps to about 1.2 amps of current.

[cl018] 18. A curing light as recited in claim 15 wherein I is more than about 100 millamps of current.